

MANUALLY OPERATED SNOW PLOW

BACKGROUND OF THE INVENTION

1. Cross-References to Related Applications

This is a utility patent application, taking priority from provisional patent application, serial number 60/403,718 filed on August 14, 2002.

2. Field of the Invention

The present invention relates generally to snow plows and more specifically to a manually operated snow plow having end blades that compensate for plowing snow, slush, water, or any other material with only one side of the plow blade.

3. Discussion of the Prior Art

There are numerous manually operated snow plows such as patent no. 2,782,533 to Eslinger and patent no. 5,791,072 to Schbot. The manually operated snow plows disclose a V-shaped snow plow with a handle extending therefrom to facilitate pushing thereof. Schbot discloses a ramp portion formed on a front of the V-shaped blade to jump uneven surfaces. However, all V-shaped snow plows suffer from at least one drawback. If only one side of the V-shaped snow plow is used, the snow will push the V-shaped snow plow sideways while plowing snow, making one sided plowing ineffective. Further, the front or rear of the V-shaped snow plow is awkward to lift.

Accordingly, there is a clearly felt need in the art for a manually operated snow plow which includes end blades that compensate for side forces induced when plowing snow, slush, water, or any other material on one side of the V-shaped blade assembly;

a front pivoting extension formed on a front of the V-shaped blade assembly; and a rear pivoting extension formed on an end of each plow blade.

SUMMARY OF THE INVENTION

The present invention provides a manually operated snow plow with end blades that compensate for the natural tendency of a V-shaped blade assembly to be pushed sideways when only one side is used to plow snow, slush, water, or any other material. The manually operated snow plow includes a V-shaped blade assembly, a pair of end blades, a front pivoting extension, and a handle. The V-shaped blade assembly includes a first plow blade and a second plow blade. The first and second plow blades are fastened to each other on a front thereof to form a V-shape. Preferably, at least one cross-bracing member is used to prevent the first and second plow blades from bending from their V-shape. The handle extends from the V-shaped blade assembly. At least one end blade extends from a length of each plow blade. Each end blade will provide a counterforce to the natural tendency of the V-shaped blade assembly to move sideways when only one plow blade is used. Each end blade will also capture a small amount of snow, or any other material.

A front pivoting extension is formed at the junction of the first and second plow blades. A front curved surface is preferably formed on a bottom of the front pivoting extension to enable the front of the V-shaped plow blade to be pushed over uneven surfaces, such as a crack in a sidewalk. The front curved surface may also be replaced with an inclined edge. The front pivoting extension

also enables the rear of the manually operated snow plow to be lifted by pivoting the front thereof on the front pivoting extension. Preferably, a rear pivoting extension is formed at substantially a rear end of each plow blade. A rear curved surface is formed on a bottom of the rear pivoting extension to enable the rear of the V-shaped plow blade to be pulled over uneven surfaces, such as a crack in a sidewalk. The rear pivoting extension also enables the front of the manually operated snow plow to be lifted by pivoting the rear thereof on the rear pivoting extension.

A second embodiment of a manually operated snow plow includes an angled plow assembly and a handle. The handle is pivotally connected to the angled plow assembly. The angled plow assembly includes a plow blade and at least one pivotal leg extending from a rear of the plow blade. The at least one pivotal leg is pivotally secured to the handle with any suitable method. The handle includes a lengthwise body terminated with a handle portion. The angled plow assembly may be symmetrical, such that the plow blade plows to the left or right. The angled plow assembly may be asymmetrical, such that the plow blade plows either to right or to the left.

A front extension blade is preferably formed at substantially a leading end of the plow blade and at least one end blade extends from substantially a trailing end of the plow blade. Each end blade will provide a counterforce to the natural tendency of the angled blade to move sideways. Each end blade will also capture a small amount of snow, or any other material. A front curved

surface is preferably formed on a bottom of the front extension blade to enable the front of the angled blade to be pushed over uneven surfaces, such as a crack in a sidewalk. Preferably, a rear extension blade is formed at the trailing end of the angled blade. A rear curved surface is formed on a bottom of the rear extension blade to enable the rear of the angled blade to be pulled over uneven surfaces, such as a crack in a sidewalk. If the angled plow assembly is symmetric, the front curved surface is formed on a bottom and top of the front extension blade and the rear curved surface is formed on a bottom and top of the rear extension blade.

Accordingly, it is an object of the present invention to provide a manually operated snow plow which allows snow to be plowed on one side of a blade assembly without the natural tendency to move sideways during plowing.

It is a further object of the present invention to provide a manually operated snow plow which allows the front thereof to be lifted by pivoting the rear.

It is yet a further object of the present invention to provide a manually operated snow plow which may be pushed and pulled when the rear thereof is in a pivoting position.

It is yet a further object of the present invention to provide a manually operated snow plow which allows the rear thereof to be lifted by pivoting the front.

It is yet a further object of the present invention to provide a manually operated snow plow which may be pushed and pulled when the front thereof is in a pivoting position.

Finally, it is another object of the present invention to provide a manually operated snow plow which will not be caught on an uneven surface when being pushed or pulled parallel to a surface or when pivoting from the surface on a front or a back thereof.

These and additional objects, advantages, features and benefits of the present invention will become apparent from the following specification.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of a manually operated snow plow in accordance with the present invention.

Figure 2 is a top view of a manually operated snow plow in accordance with the present invention.

Figure 2a is a top view of a manually operated snow plow with a V-shaped blade assembly having a pointed tip in accordance with the present invention.

Figure 2b is a top view of a manually operated snow plow with a V-shaped blade assembly having a curved tip in accordance with the present invention.

Figure 2c is a view of an end blade with at least one opening formed therethrough of a manually operated snow plow in accordance with the present invention.

Figure 2d is a cross sectional view of a second plow blade having a curved shape with a curved blade extension of a manually operated snow plow in accordance with the present invention.

Figure 3 is a side view of a manually operated snow plow in accordance with the present invention.

Figure 3a is a side view of a manually operated snow plow with a rear thereof in an elevated position in accordance with the present invention.

Figure 3b is a side view of a manually operated snow plow with a front thereof in an elevated position in accordance with the present invention.

Figure 3c is a side view of a manually operated snow plow with at least one wheel in accordance with the present invention.

Figure 3d is a side view of a manually operated snow plow, which is supported by at least one track in accordance with the present invention.

Figure 4 is a front view of a manually operated snow plow in accordance with the present invention.

Figure 5 is a rear view of a manually operated snow plow in accordance with the present invention.

Figure 6a is a perspective view of a V-shaped blade assembly having reduced height end plates of a manually operated snow plow in accordance with the present invention.

Figure 6b is a perspective view of a V-shaped blade assembly having end plates extending from a location other than an end of the plow blade in accordance with the present invention.

Figure 7 is a top schematic view of a prior art V-shaped blade assembly used to plow snow on one side and illustrating the resultant sideways force.

Figure 8 is a top schematic view of a V-shaped blade assembly of a manually operated snow plow used to plow snow on one side and illustrating the sideways force and counter sideways force in accordance with the present invention.

Figure 9 is a top schematic view of a V-shaped blade assembly of a manually operated snow plow used to plow snow on one side and illustrating what happens to excess snow that was not plowed during a first pass in accordance with the present invention.

Figure 10 is a side view of a second embodiment of a manually operated snow plow in accordance with the present invention.

Figure 11 is a top view of a second embodiment of a manually operated snow plow, such that the angled plow is pushing snow to a right of the operator in accordance with the present invention.

Figure 11a is a top view of a second embodiment of a manually operated snow plow, such that the angled plow is pushing snow to a left of the operator in accordance with the present invention.

Figure 12 is a front view of a second embodiment of a manually operated snow plow in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference now to the drawings, and particularly to figure 1, there is shown a perspective view of a manually operated snow plow 1. With reference to figures 2 - 5, the manually operated snow plow 1 includes a V-shaped blade assembly 10, a pair of end blades 12, a front pivoting extension 14, and a handle 16. The V-shaped blade assembly 10 includes a first plow blade 18 and a second plow blade 20. The first and second plow blades are

fastened to each other on a front thereof to form a V-shape. The V-shaped blade assembly 10, 10' may have a sharp front as shown in figure 2a or a curved front as shown in figure 2b. The angle "A" of the V-shape has a preferably range of between 60 - 90 degrees, but other values may also be used. A single end blade 12 extends outward from a rear of each plow blade. The angle "B" between each end blade 12 and each plow blade preferably has a range of between 45 - 120 degrees, but other values may also be used. Preferably, the length "L" of each end blade 12 is at least 10% of the length "L1" of its respective plow blade. However, other percentages besides 10% may also be used.

With reference to figure 6a, the end blades 12' do not have to be as high as the plow blades 18, 20. With reference to figure 6b, end blades 12', 12 extend from a location other than an end of the plow blade 18, 20, respectively. Additionally, more than one end blade 12, 12' may extend from a first plow blade 18, or a second plow blade 20, respectively. With reference to figure 2c, at least one opening 15 is formed through end blade 12". The opening may have any suitable shape. A gap "C" is formed from a bottom of the first plow blade 18 to a bottom of the end plate 12". It may not be necessary to have the end plate 12" continue to a bottom of the first plow blade 18 or to a bottom of a second plow blade 20.

With reference to figure 2d, a second plow blade 20' is shown with a curved cross section. The plow blades 18, 20 may have a straight cross section as shown in figure 2c, a curved cross section, or any other suitable cross sectional shape. A curved

blade extension 21 may extend from the plow blades 18, 20. The curved blade extension may be formed on the entire length of the plow blades 18, 20 or on only a portion of the length. The curved extension may be fastened to the plow blades 18, 20 or formed as a single unit. The curved blade extension 21 does not allow snow to gather under the manually operated snow plow 1, and prevent the plow blades 18, 20 from sliding over the snow when pulled backwards.

With reference to figure 7, a prior art V-shaped snow plow assembly 101 is being used to plow snow 100 with one plow blade thereof. The V-shaped snow plow 101 has a natural tendency to move sideways in the direction of force F. With reference to figure 8, each end blade 12 in the path of snow will provide a counterforce F' to offset the force F to greatly reduce the natural tendency of a V-shaped blade assembly 10 to move sideways when only one plow blade is used to plow snow. With reference to figure 9, the end blade 12 will also pick-up snow particles 102 which were not gathered during a first pass. The manually operated snow plow 1 may also be used slightly off-center. Excess snow 104 will gather along a second plow blade 20 and be retained by the end blade 12.

Preferably, cross-bracing members 22a, 22b, and 22c are used to prevent the first and second plow blades from bending from their intended V-shape. However, other types or methods of cross-bracing may also be used. The handle 16 is attached to the V-shaped blade assembly 10. The handle 16 preferably includes a pair of base members 24, a pair handle members 26, and a hand grip portion 28.

One end of each base member 24 is attached to one of the plow blades. The other end of each base member 24 is pivotally attached to one end of a single handle member 26. A plurality of angle holes 30 are formed through each base and handle member to enable the height of the handle 16 to be adjusted. A spring loaded pin 32 or the like is used to rigidly retain each handle member 26 relative to each base member 24. The hand grip portion 28 is rigidly attached to the other ends of the pair of handle members 26. However, other designs or types of handles may also be used.

With reference to figure 3a, the front pivoting extension 14 is formed at the junction of the first and second plow blades. A front curved surface 34 is preferably formed on a bottom of the front pivoting extension 14 to enable the front of the V-shaped blade assembly 10 to be pushed over uneven surfaces, such as a crack in a sidewalk. The manually operated snow plow 1 may also be pushed or pulled while resting on the front pivoting extension 14 and without collecting snow behind the blades. The front curved surface may also be replaced with an inclined edge or any other suitable shape. The front pivoting extension 14 also enables the rear of the manually operated snow plow to be lifted by pivoting the front thereof on the front pivoting extension 14. With reference to figure 3b, preferably a rear pivoting extension 36 is formed at substantially a rear end of each plow blade. A rear curved surface 38 is formed on a bottom of the rear pivoting extension 36 to enable the rear of the V-shaped blade assembly 10 to be pulled over uneven surfaces, such as a crack in a sidewalk.

The manually operated snow plow 1 may also be pushed or pulled while resting on the rear pivoting extension 36 and without collecting snow behind or in front of the plow blades 18, 20. The rear pivoting extension 26 also enables a front of the V-shaped blade assembly 10 to be lifted by pivoting the rear thereof on the rear pivoting extension 36.

With reference to figure 3c, at least one wheel 40 is pivotally attached to a bottom of the manually operated snow plow 1. With reference to figure 3d, a track 42 (similar to that of a snow mobile or the like) is attached to a bottom of the manually operated snow plow 1. An electric or fuel driven motor may be used to drive the at least one wheel 40 or the track 42.

With reference to figures 10 & 12, a second embodiment of the manually operated snow plow 2 includes an angled plow assembly 44 and a handle 46. The angled plow assembly 44 preferably has symmetry about a lengthwise centerline 45 to enable left and right plowing. The angled plow assembly 44 is flipped over to plow either right or left. However, the angled plow assembly may be asymmetrical, such that the plow blade plows either only to the right or only to the left. The handle 46 is pivotally connected to the angled plow assembly 44, such that the angled plow assembly 44 may be used to plow right or left of the operator as shown in figures 11 and 11a. The angled plow assembly 44 includes a plow blade 48 and at least one pivotal leg 50. The plow blade 48 is oriented at an acute angle "A" from its axis of travel. The at least one pivotal leg 50 is attached to a rear of the plow blade 48

with any suitable process. The at least one pivotal leg 50 is preferably pivotally secured to the handle with a pivotal rod 52 and terminated on each end with a nut 54 or the like. However, other devices may also be used. A leg curved surface 51 is preferably formed on a bottom of each pivotal leg 50 to enable the front of the angled blade 48 to be pushed over uneven surfaces, such as a crack in a sidewalk. The handle 46 includes a lengthwise body 56 terminated with a handle portion 58.

A front extension blade 60 is preferably formed substantially at a leading end of the plow blade 48 and at least one end blade 62 preferably extends from substantially a trailing end of the plow blade 48. Each end blade 62 will provide a counterforce to the natural tendency of the angled blade 48 to move sideways (as illustrated in figures 7 - 9). Each end blade 62 will also capture a small amount of snow, or any other material. An end curved surface 63 is preferably formed on a bottom of each end blade 62 to enable the front of the angled blade 48 to be pushed over uneven surfaces, such as a crack in a sidewalk. A front curved surface 64 is preferably formed on a bottom of the front extension blade 60 to enable the front of the angled blade 48 to be pushed over uneven surfaces, such as a crack in a sidewalk.

Preferably, a rear extension blade 66 is formed at a rear of the trailing end of the angled blade 48. A rear curved surface 68 is formed on a bottom of the rear extension blade 66 to enable the rear of the angled blade 48 to be pulled over uneven surfaces, such as a crack in a sidewalk. If the angled plow assembly 2 is

symmetric, the leg curved surface 51 is formed on a bottom and top of each pivotal leg 50; the front curved surface 64 is formed on a bottom and top of each front extension blade 60; the end curved surface 63 is formed on a bottom and top of each end blade 62; and the rear curved surface 68 is formed on a bottom and top of each rear extension blade 66.

A trailing extension blade 70 may be formed on a rear of the plow blade 48, behind the front extension blade 60. A trailing curved surface 72 is formed on a bottom of the trailing extension blade 70. If the angled plow assembly 2 is symmetric, the trailing curved surface 72 is formed on a bottom and top of the trailing extension blade 70.

It is preferable to make the manually operated snow plow 1, 2 to weigh as little as possible to enable thereof to be hung in a garage or the like. The handle 16, 46 may be rotated for hanging purposes to decrease the height thereof to take up a minimal amount of space. It is also preferable for the manually operated snow plow 1, 2 to be assembled from at least two separate pieces to make shipping more efficient and to be collapsible. Additional embodiments or variations in items found in the manually operated snow plow 1 are to be applied to the manually operated snow plow 2, if applicable.

While particular embodiments of the invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention in its broader aspects, and therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of the invention.